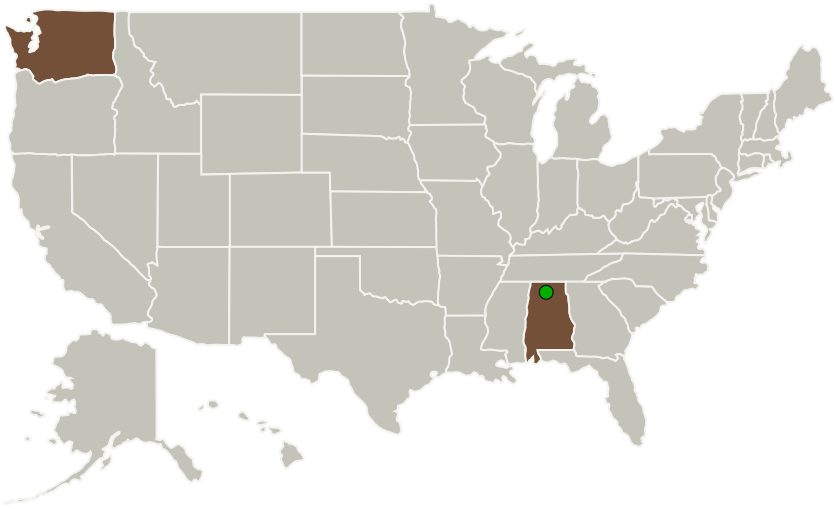
Lightweight Pump Technology for Advanced Green Monopropellants, Phase I

Completed Technology Project (2013 - 2013)

Project Introduction

Systima will develop an innovative light weight self-pressurizing pump (SPP) technology to provide a constant-pressure supply of monopropellant to a spacecraft or tactical propulsion system. The SPP does not require a helium tank and higher operating pressure have a negligible impact on the system mass. Since the SPP has a lower weight than comparable propellant pressurization systems, it provides an opportunity for reducing launch costs, increasing spacecraft or tactical system payload capacity and significantly enhancing delta velocity/ΔV. This technology can be used with hydrazine, HAN-based, or ADN-based propellants as there are no known limitations on the monopropellant that can be used in the system. The self-pressurizing lightweight pump for advanced monopropellants offers significant advantages in applications where a large ΔV is required, such as large spacecraft or in applications where high-pressure is needed, such as liquid ACS or DACS thrusters. The Phase I and Phase II SBIR will focus on development of the system for operation with the HAN-based monopropellant AF-M315E.

Primary U.S. Work Locations and Key Partners



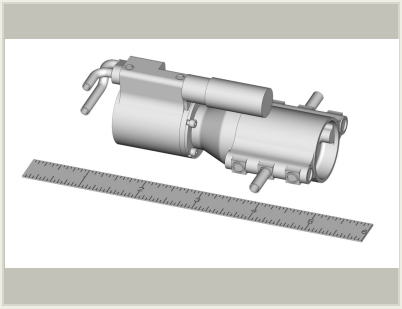


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Table of Contents

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
Systima Technologies, Inc.	Lead Organization	Industry	Kirkland, Washington
Marshall Space Flight Center(MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama

Primary U.S. Work Locations	
Alabama	Washington

Project Transitions

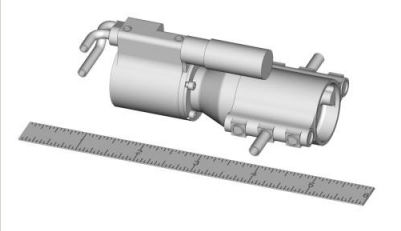
May 2013: Project Start

November 2013: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138679)*

Images



Project Image
Lightweight Pump Technology for Advanced Green Monopropellants *(https://techport.nasa.gov/image/134894)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Systima Technologies, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

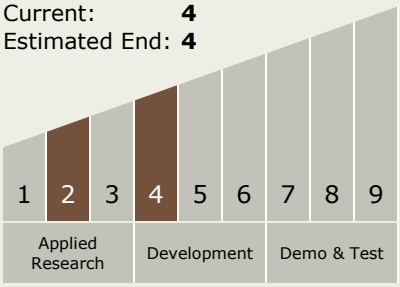
Carlos Torrez

Principal Investigator:

Paul Luccio

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX01 Propulsion Systems
  - TX01.1 Chemical Space Propulsion
    - TX01.1.2 Earth Storable

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System